United Nations Environment Programme

Distr.
GENERAL

UNEP/Bio.Div/N7-INC.5/3
23 April 1992

ORIGINAL: ENGLISH

INTERGOVERNMENTAL NEGOTIATING
COMMITTEE FOR A CONVENTION
ON BIOLOGICAL DIVERSITY
Seventh negotiating session/Fifth session of INC
Nairobi, 11-19 May 1992

BIODIVERSITY COUNTRY STUDIES

*Note by the Executive Director**

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* This note is actually the executive summary of a long synthesis report of 10 country studies whose first phases have been completed. The full report is available, in English only, for consultation by delegates upon request.

I. INTRODUCTION

1. In discussing global biodiversity conservation needs and costs, the *Ad Hoc* Working Group of Experts on Biological Diversity identified the need to carry out an in-depth study on the cost of basic conservation needs, taking into consideration the level of funding currently provided by existing development and other assistance programmes for the purpose of conserving biodiversity in developing countries. Initial cost estimates suggested that $US 1-10 billion would be needed yearly over the next 10 to 15 years to meet priority conservation needs identified by the Working Group.

2. To sharpen the estimates of projected costs, the Working Group, as well as the Intergovernmental Negotiating Committee for a Convention on Biological Diversity, recommended the preparation of country-specific case-studies taking into consideration the full range of biodiversity and ecosystems. By having a representative sample of countries, it was hoped that a preliminary extrapolation from the sample would give a global estimate of the costs, benefits and unmet needs for global biodiversity conservation and sustainable use.

3. To facilitate harmonization and comparability of the results obtained from different countries:

(a) Guidelines, including a methodology and format for the preparation of these studies, were prepared by UNEP;

(b) An international steering committee and advisory team were established to provide advice and guidance to countries and to ensure common understanding and uniformity in the application of the guidelines;

(c) The World Conservation Monitoring Centre (WCMC) in Cambridge, United Kingdom, was involved to assist and advise individual countries on information/data collection, collation, analyses and management.

4. At the national level, national biodiversity units (NBUs) were established to coordinate and oversee the preparation of the country studies.

5. Countries which agreed to undertake biodiversity case-studies include: Australia, Bahamas, Brazil, Canada, Colombia, Costa Rica, Germany, Guyana, Indonesia, Kenya, Madagascar, Malaysia, Mexico, Mozambique, Namibia, Nepal, Nigeria, Papua New Guinea, Peru, Poland, Solomon Islands, Thailand, Uganda and Zaire. They embrace a wide range of ecosystems: tropical as well as temperate forests and grasslands; arid and semi-arid lands; deserts; tundras; mangroves, coral reefs and marine ecosystems; swamps, marshes and freshwater habitat; heaths and moorlands.

6. Ten of the above-mentioned countries have submitted their biodiversity country-study reports: Bahamas, Canada, Costa Rica, Germany, Indonesia, Kenya, Nigeria, Poland, Thailand and Uganda. This list includes both developing and developed countries, representing a wide spectrum of socio-economic levels, biodiversity richness and global biogeographical realms.

II. STATUS OF BIODIVERSITY

7. Each country study attempted to describe the whole range of biodiversity in the country following the guidelines. The studies include inventories of species, habitats, ecosystems, national protected areas and ex situ conservation facilities and institutions, noting any gaps in

knowledge. In each of these categories, countries provided best available indications of the current status of their biodiversity and, to the extent possible, estimates of its rate of change.

8. Estimates of the total number of species on Earth range between 10 million and 80 million. Of this total, approximately 1.7 million species have been described, representing between 2.1 and 17 per cent of the estimated global total. The total numbers of species reported from the 10 countries submitting country studies are: Bahamas; 6,206; Canada; 71,309; Costa Rica; 84,392; Germany; 53,000; Indonesia; 46,605; Kenya; 34,863; Nigeria; 28,660; Poland; 46,903; Thailand; 122,200; and, Uganda; 18,430.

9. The country studies highlight the lack of available knowledge on the total species numbers occurring within the countries studied. Species numbers reported therefore reflect the amount of past research and the accessibility of data to the national biodiversity units and not necessarily actual species diversity.

10. Information about higher vertebrates (except for fish) and vascular plants is substantial. Information on other groups of organisms such as microbes is, however, limited. In future, national biodiversity units could refine information on all taxonomic groups and initiate programmes to repatriate the large volume of data held abroad. This point is particularly pertinent for data on plants.

11. All 10 countries indicate the number of sites and total areas considered as national centres of high species endemism as well as total areas of various ecosystems.

12. All 10 countries demonstrate a firm commitment to *in situ* conservation as a strategic approach to biodiversity conservation. Measures to increase total area under national protection systems are proposed by expanding existing gazetted systems and/or establishing new areas.

13. Total protected areas in the 10 countries cover 123,172,242 ha, which represents 19 per cent of the global total of 651,487,597 ha reported in the 1990 United Nations List of National Protected Areas.

14. Most countries attach great importance to *ex situ* conservation to complement *in situ* activities. All the countries propose to increase the number of *ex situ* conservation facilities or strengthen existing ones, although not all countries indicate the additional number required.

III. MEASURES FOR CONSERVATION AND SUSTAINABLE USE OF BIODIVERSITY

15. The country studies identify biodiversity of significance for conservation and indicate measures to achieve certain levels of conservation and sustainable use. The measures proposed by Governments in their country studies to a great extent convey the concerns of Governments worldwide as reflected in the fifth draft Convention on Biological Diversity currently under negotiation. The relevant articles (5-20) of the draft anticipate a wide range of activities that countries would be expected to undertake in fulfilment of the Convention.

16. The measures proposed in country studies feature prominently in the actions outlined in the Global Biodiversity Strategy as well as those in *Caring for the Earth. A Strategy for Sustainable Living*. This is

important since the strategies in these two documents are broad-based and contain essential/critical and far-reaching actions, most of which require implementation at the national level.

17. The differences among the measures proposed by different countries reflect a number of factors including the status of biodiversity conservation and use within the country, the opportunities for development of biodiversity-based commercial activities, the threats to biodiversity, etc. For example, in countries where the use of biodiversity as a major contributor to the national economy is well established, biological research to improve the scientific basis for conservation of the resource and its sustainable use has tended to take precedence. Where environmental degradation is a matter of serious national concern, management measures such as rehabilitation of degraded lands, improvement of past practices, development of sustainable uses of biodiversity and enforcement measures predominated. Where programmes are just beginning, institution-building is seen as a major requirement.

18. The preparation of a country study has, of itself, proved to be a very valuable measure for setting a country on a clearer path towards better conservation and more rational use of its biodiversity. In the course of this process, national biodiversity units have been established and data on the identity and status of biodiversity that exist within or outside the country are progressively being assembled. The concept of counting the costs and benefits of biodiversity conservation and utilization has been introduced and is being progressively clarified. The country-studies exercise and their resultant national biodiversity units could prove to be a useful foundation upon which to build a national capacity for institutional and human capacity building. The results could be used for further development and strengthening of the national biodiversity units into national biodiversity monitoring centres and their linking into a global biodiversity information network that can be expanded with subsequent rounds of country studies.

IV. ESTIMATION OF COSTS OF MEASURES FOR CONSERVATION AND SUSTAINABLE USE OF BIOLOGICAL DIVERSITY

19. The country studies have attempted to estimate the additional costs that could be incurred by developing countries as a result of undertaking or strengthening activities that will ensure effective conservation or use of biological diversity. Quantification of such costs is a complex exercise and precision is difficult to achieve. Time constraints have prevented countries from gathering information comprehensively from all sources. This is compounded by the fact that there is no baseline or clearly defined set of initial reference conditions to calculate additional costs. In addition, other cost items/measures may exist, the precise costing of which does not appear possible at present. Under the circumstances, the cost figures derived from the country studies should be viewed only as orders of magnitude.

20. In order to have concrete commitments to the conservation of biodiversity, it is useful to identify a global aggregate figure (a realistic order of magnitude) of costs based on national measures to be undertaken by developing countries. Countries undertaking studies were therefore asked to identify biota of significance for conservation and use, indicate the measures they plan to undertake to achieve the required level of biodiversity conservation and its sustainable use and to give an estimate of the additional costs that they can expect to arise from implementing the identified measures.

21. Countries which have a sound infrastructure for biodiversity conservation require less funds per unit of species and ecosystems conservation than those which have a badly damaged or neglected infrastructure. This makes the cost profile of individual countries different. However, it is possible to draw meaningful conclusions in terms of the international assistance needed. Other factors that could affect the cost profile are the total land area of the country concerned, its accessibility, institutional and human capacity, population size, effectiveness of public administration, and existing infrastructure. The mix of measures identified by the countries and their relative priorities reflected these considerations. It is important to note that no adjustments are made to the cost figures reported by individual countries for probable biases in reporting or differences in estimation methodologies.

22. Incremental costs in the context of biodiversity conservation constitute compensation for expenditures not offset by nationally appropriated benefits. The unmet costs estimated in the country studies consist of two components: *additional* costs beyond present level of expenditure which could generate national benefits and *incremental* costs that do not generate such nationally appropriated benefits. In the studies, costings were made of activities that could generate both national and international benefits (the so-called joint product problem). None of the country studies received so far have tackled the issue of incremental costs. It is, however, not easy to define with any exactitude which costs are incremental. Flexibility is therefore warranted in the application of the incremental costs approach. The incremental costs must be calculated against a "business-as-usual" baseline plan drawn from a purely national perspective.

23. The 10 country studies received so far have attempted to cost the measures identified by them for the conservation and sustainable utilization of biodiversity and to calculate their unmet needs. These measures cover a broad, but largely common, approach to biodiversity conservation and use. Important differences in the priorities attached to different measures or groups of measures and differences in the progress already made in their implementation, thus create a disparity in the estimation of the magnitude of the unmet costs by individual countries.

24. The total and unmet annual costs assessed in the 10 studies are as follows:

	Total annual costs (Millions of US dollars)	Unmet annual costs (Millions of US dollars)
AFRICA:		
1. Kenya	160	37
2. Nigeria	593	325
3. Uganda	70	58
ASIA:		
4. Indonesia	290	231
5. Thailand	120	60
EUROPE:		
6. Poland	800	100
7. Germany	1200	950
LATIN AMERICA/CARIBBEAN:		
8. Bahamas	110	84
9. Costa Rica	100	81
NORTH AMERICA:		
10. Canada	2686	986

25. From the figures supplied by the seven developing countries listed above, the following seven broad scenarios were established for estimating the annual unmet funding needs of all developing countries:

A. Extrapolation on the basis of the unmet needs of the seven developing countries adjusted for biodiversity richness and country size;

B. Extrapolation on the basis of a percentage of GDP as desirable expenditure for biodiversity conservation and sustainable use;

C. Extrapolation on the basis of the number of sites and total area of national protection systems as percentage of global total;

D. Extrapolation on the basis of species diversity in each developing country as percentage of global described species:

E. Extrapolation on the basis of both biodiversity richness and *in situ* Conservation Infrastructure;

F. Extrapolation on the basis of unmet needs identified by developing countries adjusted for number of countries per region;

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G. Extrapolation on the basis of average conservation cost per square kilometre taken from the country studies of developing countries.

26. Different rationales are used to extrapolate total additional funding requirements from the sample of country studies available. For some proposed scenarios (F and G), the present sample is too small, but they should be considered when more country studies are available. It should also be noted that all the methods will give better results when more countries are included.

27. Out of the seven scenarios, the global annual unmet funding needs of developing countries for effective conservation and use of biodiversity can so far be meaningfully derived from only five of them, namely, A, B, C, D, and E. The estimates obtained using different scenarios are as follows:

Scenario	Deflator*	Billions of US dollars
A. Extrapolation on the basis of unmet needs of developing countries adjusted for biodiversity richness and country size	25%	8.45
B. Extrapolation on the basis of a percentage of GDP (0.5%) as desirable expenditure for biodiversity conservation and sustainable use	-	21.13 to 42.25
C. Extrapolation on the basis of the number of sites and total area national protection systems as percentages of global total	-	42.0
D. Extrapolation on the basis of species diversity in each country as percentage of global described species	-	0.68 to 15.8
E. Extrapolation on the basis of both biodiversity richness and *in situ* conservation infrastructure	25%	11.1

* A deflator was applied to reflect - among other things - possible over-costing and reliance on non-cost effective measures.

28. Clearly, the estimates are no more than orders of magnitude. They may, however, be useful in the discussion on the nature and extent of financial resources to be transferred to developing countries if they have to meet their obligations under the Convention. Additional and more precise information at the country level is needed before it is possible to go any further with this kind of analysis. Because of a lack of time and available resources, the scenarios presented above are based largely on univariate methods. Estimating unmet needs based on multivariate techniques might have enhanced the precision of the predictions of these scenarios.

29. It is worth noting in this connection that the total annual costs of 117 developing countries in scenario A, for example, comes to $12.67 billion, i.e. $8.45 billion multiplied by 1.5 (from the country studies received the total annual cost appears to be 1.5 times the annual unmet costs. Total costs for the 31 OECD members and other high-income economies (such as oil-producing countries) amount to $56.9 billion (based on the median figure between the Canadian and the German total costs -

these were the only two developed-country studies received). Total global annual costs then amount to $69.57 billion per annum (i.e. $12.67 billion plus $56.9 billion).

30. *Interim funding for the convention.* A possible scenario for interim funding until the Convention comes into force is proposed as follows, taking into consideration that estimates B and C are outliers:

(a) An increase of $500 million per year in the next five years raising the present flow of external assistance from around $100 million from the Global Environment Facility to $600 million per year up to 1997;

(b) Thereafter, a slightly accelerated flow (of around an additional $750 million) could be anticipated, raising the total funds from external funding per year to $850 million over the next three years (that is a total of approximately $5.5 billion to end of century). In other words, a roll-over mechanism is called for, starting realistically but accelerating once the institutional and human capacity as well as infrastructure are in place.

V. THE BENEFITS OF CONSERVING BIODIVERSITY AND THE COST OF INACTION

31. Benefits estimates can be important in showing that funds committed to conservation of biodiversity and its sustainable use may be regarded as an investment that contributes to maintaining and enhancing the well-being of local and international societies and their economies. Alternatively, such estimates can indicate the level of "cost of inaction" in terms of reduced or lost benefits if no action is taken to conserve biodiversity and use it in a sustainable way.

32. Many of the benefits that biodiversity provides fall outside the cash economy. Even when some socio-economic benefits accruing to society can be given a cash value (monetized), these benefits do not translate to cash. Although the replacement value of these goods and services may have a very high monetary equivalent, the people and the developing country in question seldom have the cash in hand to reinvest in biodiversity conservation.

33. It is evident that the time-frame within which the studies were conducted did not allow the national biodiversity units enough time to deal adequately with the benefits resulting from their biodiversity at least as far as the monetization of the benefits is concerned. Detailed estimates of the benefits of conserving biodiversity and its use were provided by a few countries using evolving valuation techniques. Others have relied on approximate indicators of the total value of gross output in sectors (such as fisheries, forestry, agriculture, etc.) where 'biodiversity' is of importance.

34. The benefits provided by eight countries varied considerably. A majority of the countries used gross benefits from sectors such as forestry and agriculture. The ratio of gross benefits to costs ranged from 5 to 20 for five of the countries but the range was considerably large for the remaining three (these ratios are 0.1, 46 and 951).

35. Other aspects of benefits evaluation such as estimation of the net benefits attributable to biodiversity rather than gross benefits, benefits related only to the proposed measures rather than to total country's biodiversity, initial investments required to generate the benefits, national and international benefits, non-use values, distribution of

benefits at national and international levels as well as the issue of sustainability in generating benefits were not adequately addressed in this round of country studies.

36. Despite their limitations, the studies shed some light on what proportion of the monetized benefits from biodiversity conservation will be at risk if the minimum costs are not met.